Drinking Water Surveillance Program

TILBURY NORTH (STONEY POINT) WATER SUPPLY SYSTEM

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TILBURY NORTH (STONEY POINT) WATER SUPPLY SYSTEM

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT 1988

FEBRUARY 1990

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EXECUTIVE SUMMARY

DRINKING WATER SURVEILLANCE PROGRAM

TILBURY NORTH (STONEY POINT) WATER SUPPLY SYSTEM
1988 ANNUAL REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. Currently, 52 plants are being monitored.

The Tilbury North (Stoney Point) Water Supply System treats water from Lake St. Clair. The plant is a conventional treatment plant consisting of coagulation, flocculation, clarification, filtration and disinfection. This plant has a design capacity of 4.45 x 1000 m^3/day and serves a population of 3,500.

Raw and Treated water samples were analyzed for approximately 160 parameters in June, July and November. Parameters were divided into the following groups Bacteriological, Inorganic and Physical(Laboratory Chemistry, Field Chemistry and Metals) and Organics (Chloroaromatics, Chlorophenols, Pesticides and PCB, Phenolics, Polynuclear Aromatic Hydrocarbons, Specific Pesticides and Volatiles).

A summary of results is shown in Table 1.

Inorganic and Physical parameters (Laboratory Chemistry, Field Chemistry and Metals) were all below applicable health related ODWOs.

Of approximately 110 Organic parameters tested for, none exceeded health related guidelines.

For 1988 the limited DWSP sampling results indicated that the Tilbury North (Stoney Point) Water Supply System produced good quality water.

TABLE 1

DRINKING WATER SURVEILLANCE PROGRAM STONEY POINT (TILBURY NORTH WSS)

SUMMARY TABLE BY SCAN

	SCAN	RAW TESTS	RAW POSITIVE	RAW %POSITIVE	TREATED TESTS	TREATED POSITIVE	TREATED %POSITIVE
	BACTERIOLOGICAL	8	5	62	11	1	9
	CHEMISTRY (FLD)	9	9	100	17	17	100
	CHEMISTRY (LAB)	62	50	80	59	39	66
	METALS	71	42	59	71	32	45
	CHLOROAROMATICS	42	0	0	28	0	0
	CHLOROPHENOLS	12	0	0	12	0	0
	PAH	17	0	0	51	0	0
	PESTICIDES & PCB	100	0	0	79	0	0
	PHENOLICS	3	2	66	3	0	0
	SPECIFIC PESTICIDES	46	0	0	56	0	0
	VOLATILES	86	0	0	57	8	14
TOTAL		456	108		444	97	

NO HEALTH RELATED GUIDELINES WERE EXCEEDED

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A '.' INDICATES THAT NO SAMPLE WAS TAKEN

DRINKING WATER SURVEILLANCE PROGRAM

TILBURY NORTH (STONEY POINT) WATER SUPPLY SYSTEM
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INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. Currently, 52 plants are being monitored.

The DWSP was initiated at the Tilbury North (Stoney Point) Water Supply System in 1985 as part of a study on the St. Clair/Detroit river area . Annual reports were published in 1986 (ISBN 0-7729-2566-6)and 1987 (ISSN 0839-8933).

This report contains information and results for 1988.

PLANT DESCRIPTION

The Tilbury North (Stoney Point) Water Supply System uses a conventional treatment plant which treats water from Lake St. Clair. The process consists of coagulation, flocculation and clarification (solids contact upflow clarifier), filtration and disinfection. The plant has a design capacity of 4.45 x 1000 m^3/day

and flows on day of sampling ranging from 1.3 x 1000 m^3/day to 2.6 x 1000 m^3/day. The system serves a population of 3,500 people. The plant location is shown in Figure 1. Plant process details are shown in Figure 2. General plant information is presented in Table 2.

METHODS

Water samples were obtained from two DWSP approved locations;

i) Raw - The water originated from the lowlift discharge and was sampled through a copper sample line. The sample tap is located at the lowlift discharge.

ii) Treated - The water originated from the highlift discharge after addition of all treatment chemicals and was sampled through a copper sample line. The sample tap is located in the plant laboratory.

Sample lines in the plant were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

Attempts were made to capture the same block of water at each sampling point by taking the retention time into consideration. The retention time was calculated by dividing the volume of water between the two sampling points by the sample day flow. For example, if it was determined that the retention time within the

FIGURE 1

DRINKING WATER SURVEILLANCE PROGRAM

SITE LOCATION MAP

TILBURY NORTH WATER SUPPLY SYSTEM

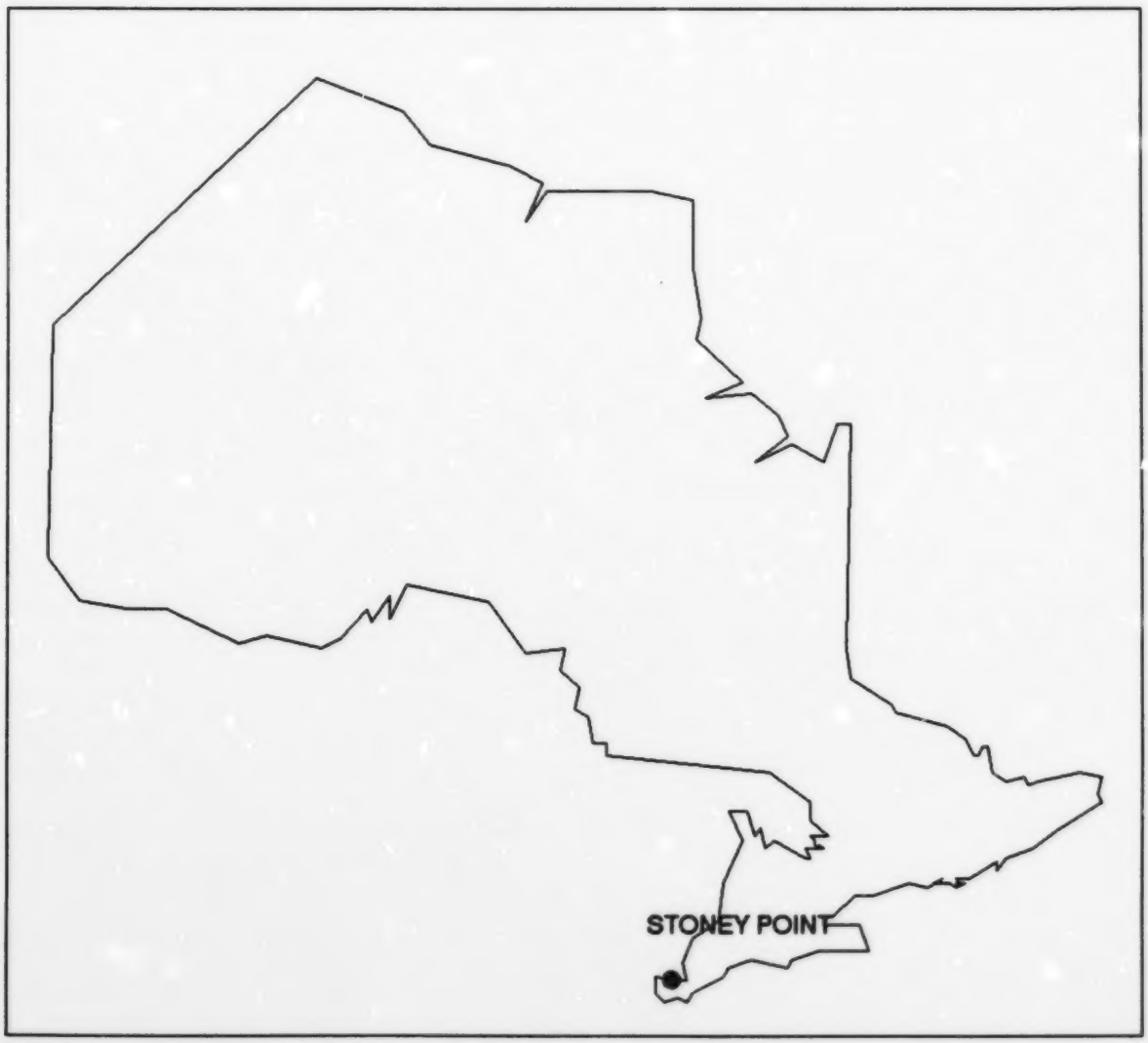

FIGURE 2

STONEY POINT WATER TREATMENT PLANT

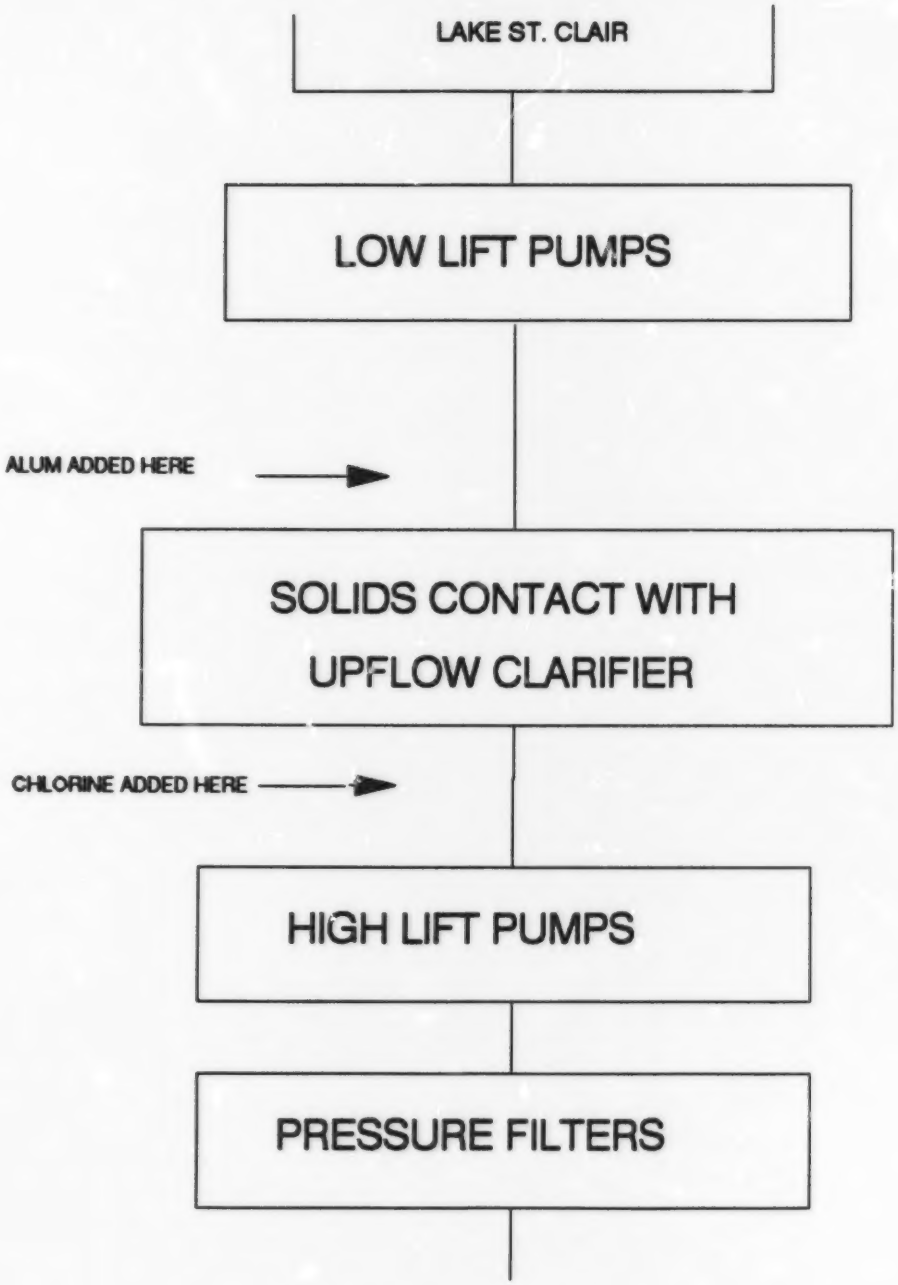

TABLE 2

DRINKING WATER SURVEILLANCE PROGRAM ANNUAL REPORT

GENERAL INFORMATION

TILBURY NORTH (STONEY POINT) WATER SUPPLY SYSTEM

LOCATION:	6011 ST. CLAIR RD WEST P.O. BOX 70 STONEY POINT, ONTARIO N0R 1N0 (519-798-3313)
SOURCE:	RAW WATER SOURCE - LAKE ST CLAIR
DESIGN CAPACITY:	4.45 (1000 M^3/DAY)
OPERATION:	MUNICIPAL
PLANT SUPERINTENDENT:	L. HILLMAN
MINISTRY REGION:	SOUTHWESTERN
DISTRICT OFFICER:	J. DRUMMOND

MUNICIPALITY SERVED	POPULATION
TILBURY NORTH	3,155
TILBURY WEST	326

plant was five hours then there would be a five hour interval between the raw and treated sampling.

Stringent DWSP sampling protocols were followed to ensure that all samples were taken in the same manner.

Sample day flow, treatment chemical dosages and field measurements such as Turbidity, Chlorine Residuals, pH and Temperature were recorded on the day of sampling and were entered onto the DWSP data base as submitted.

RESULTS

Water at the Tilbury North (Stoney Point) Water Supply System was sampled for approximately 160 parameters in June, July and November.

Table 3 contains information on the sample day retention time, flow rate and treatment chemicals used and their associated dosages.

Table 4 is a summary break-down of the number of water samples analysed by parameter and by water type. The number of times that a positive or trace result was detected is also reported.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of Environment (MOE)

laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 presents the results for parameters detected on at least one occcasion.

Table 6 lists all parameters analysed on the DWSP.

Associated guidelines and detection limits are also supplied on tables 5 and 6. Parameters are listed alphabetically within each scan.

DISCUSSION

General

Water quality is judged by comparison with the Ontario Drinking Water Objectives (ODWOs) as defined in the 1984 publication (ISBN 0-7743-8985-0). The Province of Ontario has health related and aesthetic objectives for 49 parameters, these are currently under review. When an ODWO is not available guidelines/limits from other agencies are consulted. The Parameter Listing System (PALIS) recently published (ISBN 0-7729-4461-X) by the MOE catalogues and keeps current over 1750 guidelines for 650 parameters from agencies

throughout the world.

Although some of the parameters measured on DWSP may be present in the raw and treated water as a result of pollution, many of the compounds detected are naturally occurring or are treatment by-products.

Plant operational personnel address occurrences of taste and odour or biological water quality parameters. The DWSP does not assess these aspects of the water supply.

As stated under Results, traces do not indicate quantifiable results as defined by established MOE laboratory analytical reporting protocols. While they can be useful in trend analysis or confirmation of the presence of a specific contaminant that is repeatedly detected at these levels, the occasional finding of a trace level of a contaminant is not considered to be significant. **DISCUSSION OF GUIDELINES AND LIMITS THEREFORE, IS ONLY CONDUCTED ON POSITIVE RESULTS.**

Bacteriology

Positive results were present once in the treated water.
This result was Standard Plate Count. No ODWOs were exceeded.

Standard Plate Count is a test used to supplement routine analysis

for Coliform bacteria. The limit for Standard Plate Count (at 35°C after 48 hours) in the ODWOs is 500 organisms per mL (based on a geometric mean of 5 or more samples).

Guidelines for bacteriological sampling and testing of a supply are developed to maintain a proper supervision of its bacteriological quality; the routine monitoring program usually requires the taking of multiple samples in a given system. Routine bacteriological monitoring, as outlined in the ODWOs is carried out by the operating authority.

Inorganic and Physical

Laboratory and Field Chemistry

The results for the Laboratory Chemistry and Field Chemistry scans were below all applicable health related ODWOs.

It is desirable that the Temperature of drinking water be less than 15°C; the palatability of water is enhanced by its coolness. A temperature below 15°C will tend to reduce the growth of nuisance organisms and hence minimize associated taste, colour, odour and corrosion problems. The temperature of the treated water may increase as a result of higher temperatures in the source water. The desired ODWO was exceeded in the June and July treated water.

The ODWO indicate that a hardness level of between 80 and 100 mg/L

as calcium carbonate for domestic waters, provides an acceptable balance between corrosion and incrustation. Water supplies with a hardness greater than 200 mg/L are considered poor, and would possess a tendency to form scale deposits and result in excessive soap consumption. The hardness levels for the Tilbury North water ranged from 104 to 119 mg/L as Calcium carbonate.

The Langelier Index is used extensively in estimating the corrosion potential of water. An increasingly negative index indicates the increasing possibility of corrosion. It is considered sound engineering practice to maintain a slightly positive Langelier Index. The Langelier Index for the Tilbury North water is negative.

Metals

The results reported for the Metals scan were below any applicable health related ODWOs.

Copper, Iron, Manganese, Lead and Zinc levels were lower in the treated water as compared to the raw water. This is the result of the treatment process. The addition of Alum as a coagulant to the raw water (Table 3) and the resulting coagulation/settling process has been shown to reduce the levels of most metals.

At present, there is no evidence that Aluminum is physiologically harmful and no health limit for drinking water has been specified. The measure of residual Aluminum in the treated water is important

to indicate the efficiency of the treatment process. The ODWOs indicate that a useful guideline is to maintain a residual below 100 ug/L as Al in the water leaving the plant to avoid problems in the distribution system. Aluminum values exceeded the ODWO operational guideline in June.

Organic Parameters

Chloroaromatics

The results of the Chloroaromatics scan showed that no Chloroaromatics were detected.

Chlorophenols

The results of the Chlorophenols scan showed that no Chlorophenols were detected.

Pesticides and PCB (Polychlorinated Biphenyls)

The results of the Pesticides and PCB scan showed that no PCBs were detected and that one pesticide was detected:

Alpha BHC

There are several isomers of BHC (Benzene Hexachloride); gamma BHC is the active ingredient of the pesticide Lindane, while alpha BHC is the most predominant isomer found in surface waters of the Great Lakes Basin, as indicated in results from other water supplies on DWSP.

Alpha BHC was detected at trace levels, twice in the raw water and twice in the treated water.

Specific Pesticides

Results of the Specific Pesticides scan showed that no parameters were detected.

Phenolics

The maximum desirable concentration of phenolic substances in drinking water is 2.0 ug/L. This limit has been set primarily to prevent the occurrence of undesirable tastes and odours, particularly in chlorinated water. Phenolics were detected at 1.2 ug/L in both the June and November raw water samples. Phenolics were detected at trace levels, once in the raw water and three times in the treated water. Phenolic compounds are present in the aquatic environment as a result of natural and/or industrial processes.

Polynuclear Aromatic Hydrocarbons (PAH)

The results of the PAH scan showed that no PAHs were detected.

Volatiles

The results of the Volatiles scan showed that five parameters other than Trihalomethanes(THMs), were detected:

Benzene

Toluene

Ethylbenzene

Meta-Xylene

Styrene

Benzene was detected at trace levels, once in the raw water and once in the treated water.

Toluene was detected at a trace level once in the treated water. The detection of toluene at low, trace levels is a laboratory artifact derived from the analytical methodology. The purge-and-trap analytical technique depends on the purging of the volatile organics in the water sample with helium gas onto a Tenax trapping column. The volatile materials are subsequently thermally desorbed, separated and quantified. Tenax, a toluene-like polymeric material, tends to decompose sporadically upon heating into toluene and other aromatic componenets (ethylbenzene and xylene) giving instrument blanks in the order of 0.05 ug/L.

The detected trace levels of Styrene are also considered to be laboratory artifacts due to the outgassing of monomeric styrene from the polystyrene shipping containers. The sporadic background levels from this source are in the order of 0.05 ug/L.

Ethylbenzene was detected at a trace level once in the treated water.

Meta-Xylene (M-Xylene) was detected at a trace level once in the treated water.

THMs are acknowledged to be produced during the water treatment process and will always occur in chlorinated surface waters. THMs are comprised of Chloroform, Chlorodibromomethane and Dichlorobromomethane. Bromoform occurs occasionally. Results are reported for the individual compounds as well as for total THMs.

Chloroform, Chlorodibromomethane, Dichlorobromomethane and Total THMs were detected in all of the treated water samples. Bromoform was detected at trace levels. All Total THM occurrences, ranging from 41.7 to 59.8 ug/L, were well below the ODWO of 350 ug/L.

CONCLUSIONS

The Tilbury North (Stoney Point) Water Supply System for the sample year of 1988 produced good quality water at the plant based on the limited DWSP results. Comparison with the results from the DWSP for 1986 and 1987 show that the raw and treated water quality has remained consistent.

No health related guidelines, for organic or inorganic parameters, were exceeded.

TABLE 3

DRINKING WATER SURVEILLANCE PROGRAM STONEY POINT (TILBURY NORTH WSS) SAMPLE DAY CONDITI 1988

SAMPLE DAY CONDITIONS			TREATMENT CHEMICAL DOSAGES (MG/L)	
			POST-CHLORINATION	COAGULATION
			CHLORINE	ALUM DRY
DATE	RETENTION TIME(HRS)	FLOW (1000M3)		
JUN 14	11.0	2.6	2.89	28.12
JUL 18	13.0	1.5	3.30	29.98
NOV 15	16.0	1.3	1.30	33.00

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM TILBURY

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
BACTERIOLOGICAL	FECAL COLIFORM MF	3	0	0	.	.	.
	STANDRD PLATE CNT MF	1	1	0	3	1	0
	P/A BOTTLE	.	.	.	2	0	0
	TOTAL COLIFORM MF	2	2	0	3	0	0
	T COLIFORM BCKGRD MF	2	2	0	3	0	0
*TOTAL SCAN BACTERIOLOGICAL		8	5	0	11	1	0
*TOTAL GROUP BACTERIOLOGICAL		8	5	0	11	1	0
CHEMISTRY (FLD)	FLD CHLORINE (COMB)	.	.	.	2	2	0
	FLD CHLORINE FREE	.	.	.	3	3	0
	FLD CHLORINE (TOTAL)	.	.	.	3	3	0
	FLD PH	3	3	0	3	3	0
	FLD TEMPERATURE	3	3	0	3	3	0
	FLD TURBIDITY	3	3	0	3	3	0
*TOTAL SCAN CHEMISTRY (FLD)		9	9	0	17	17	0
CHEMISTRY (LAB)	ALKALINITY	3	3	0	3	3	0
	CALCIUM	3	3	0	3	3	0
	CYANIDE	3	0	0	3	0	1
	CHLORIDE	3	3	0	3	3	0
	COLOUR	3	1	1	3	0	1

TABLE 4

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SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
CHEMISTRY (LAB)	CONDUCTIVITY	3	3	0	3	3	0
	FLUORIDE	3	3	0	3	3	0
	HARDNESS	3	3	0	3	3	0
	IONCAL	3	2	0	3	2	0
	LANGELIERS INDEX	3	3	0	0	0	0
	MAGNESIUM	3	3	0	3	3	0
	SODIUM	3	3	0	3	3	0
	AMMONIUM TOTAL	3	2	0	3	0	2
	NITRITE	3	1	2	3	0	0
	TOTAL NITRATES	3	3	0	3	3	0
	NITROGEN TOT KJELD	3	3	0	3	2	1
	PH	3	3	0	3	3	0
	PHOSPHORUS FIL REACT	3	1	2	3	0	3
	PHOSPHORUS TOTAL	3	2	1	3	0	1
	SULPHATE	2	2	0	2	2	0
	TURBIDITY	3	3	0	3	3	0
*TOTAL SCAN CHEMISTRY (LAB)		62	50	6	59	39	9
METALS	SILVER	3	0	0	3	1	1
	ALUMINUM	3	3	0	3	3	0
	ARSENIC	3	0	3	3	0	2
	BARIUM	3	3	0	3	3	0
	BORON	3	2	1	3	2	1

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM TILBURY

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
METALS	BERYLLIUM	3	0	1	3	0	1
	CADMIUM	3	0	1	3	0	0
	COBALT	3	2	1	3	1	2
	CHROMIUM	3	3	0	3	2	1
	COPPER	3	3	0	3	3	0
	IRON	3	3	0	3	0	2
	MERCURY	3	1	1	3	1	1
	MANGANESE	3	3	0	3	3	0
	MOLYBDENUM	3	0	3	3	3	0
	NICKEL	3	0	3	3	0	2
	LEAD	3	3	0	3	0	3
	ANTIMONY	2	1	1	2	1	1
	SELENIUM	3	0	2	3	0	3
	STRONTIUM	3	3	0	3	3	0
	TITANIUM	3	3	0	3	3	0
	THALLIUM	3	0	0	3	0	0
	URANIUM	3	3	0	3	0	2
	VANADIUM	3	3	0	3	0	3
	ZINC	3	3	0	3	3	0
*TOTAL SCAN METALS		71	42	17	71	32	25
*TOTAL GROUP INORGANIC & PHYSICAL		142	101	23	147	88	34
CHLOROAROMATICS	HEXACHLOROBUTADIENE	3	0	0	2	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM TILBURY

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
CHLOROAROMATICS	123 TRICHLOROBENZENE	3	0	0	2	0	0
	1234 T-CHLOROBENZENE	3	0	0	2	0	0
	1235 T-CHLOROBENZENE	3	0	0	2	0	0
	124 TRICHLOROBENZENE	3	0	0	2	0	0
	1245 T-CHLOROBENZENE	3	0	0	2	0	0
	135 TRICHLOROBENZENE	3	0	0	2	0	0
	HCB	3	0	0	2	0	0
	HEXACHLOROETHANE	3	0	0	2	0	0
	OCTACHLOROSTYRENE	3	0	0	2	0	0
	PENTACHLOROBENZENE	3	0	0	2	0	0
	236 TRICHLOROTOLUENE	3	0	0	2	0	0
	245 TRICHLOROTOLUENE	3	0	0	2	0	0
	26A TRICHLOROTOLUENE	3	0	0	2	0	0
*TOTAL SCAN CHLOROAROMATICS		42	0	0	28	0	0
CHLOROPHENOLS	234 TRICHLOROPHENOL	2	0	0	2	0	0
	2345 T-CHLOROPHENOL	2	0	0	2	0	0
	2356 T-CHLOROPHENOL	2	0	0	2	0	0
	245-TRICHLOROPHENOL	2	0	0	2	0	0
	246-TRICHLOROPHENOL	2	0	0	2	0	0
	PENTACHLOROPHENOL	2	0	0	2	0	0
*TOTAL SCAN CHLOROPHENOLS		12	0	0	12	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM TILBURY

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
PAH	PHENANTHRENE	1	0	0	3	0	0
	ANTHRACENE	1	0	0	3	0	0
	FLUORANTHENE	1	0	0	3	0	0
	PYRENE	1	0	0	3	0	0
	BENZO(A)ANTHRACENE	1	0	0	3	0	0
	CHRYSENE	1	0	0	3	0	0
	DIMETH. BENZ(A)ANTHR	1	0	0	3	0	0
	BENZO(E) PYRENE	1	0	0	3	0	0
	BENZO(J) FLUORANTHEN	0	0	0	0	0	0
	BENZO(B) FLUORANTHEN	1	0	0	3	0	0
	PERYLENE	1	0	0	3	0	0
	BENZO(K) FLUORANTHEN	1	0	0	3	0	0
	BENZO(A) PYRENE	1	0	0	3	0	0
	BENZO(G,H,I) PERYLEN	1	0	0	3	0	0
	DIBENZO(A,H) ANTHRAC	1	0	0	3	0	0
	INDENO(1,2,3-C,D) PY	1	0	0	3	0	0
	BENZO(B) CHRYSENE	1	0	0	3	0	0
	ANTHANTHRENE	0	0	0	0	0	0
	CORONENE	1	0	0	3	0	0
*TOTAL SCAN PAH		17	0	0	51	0	0
PESTICIDES & PCB	ALDRIN	3	0	0	2	0	0
	ALPHA BHC	3	0	2	2	0	2

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM TILBURY

SUMMARY TABLE OF RESULTS (1988)

		RAW			TREATED		
SCAN	PARAMETER	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
PESTICIDES & PCB	BETA BHC	3	0	0	2	0	0
	LINDANE	3	0	0	2	0	0
	ALPHA CHLORDANE	3	0	0	2	0	0
	GAMMA CHLORDANE	3	0	0	2	0	0
	DIELDRIN	3	0	0	2	0	0
	METHOXYCHLOR	3	0	0	2	0	0
	ENDOSULFAN 1	3	0	0	2	0	0
	ENDOSULFAN II	3	0	0	2	0	0
	ENDRIN	3	0	0	2	0	0
	ENDOSULFAN SULPHATE	3	0	0	2	0	0
	HEPTACHLOR EPOXIDE	3	0	0	2	0	0
	HEPTACHLOR	3	0	0	2	0	0
	MIREX	3	0	0	2	0	0
	OXYCHLORDANE	3	0	0	2	0	0
	OPDDT	3	0	0	2	0	0
	PCB	3	0	0	2	0	0
	DDD	3	0	0	2	0	0
	PPDDE	3	0	0	2	0	0
	PPDDT	3	0	0	2	0	0
	AMETRINE	3	0	0	3	0	0
	ATRAZINE	3	0	0	3	0	0
	ATRATONE	3	0	0	3	0	0
	CYANAZINE	3	0	0	3	0	0
	DES ETHYL ATRAZINE	2	0	0	2	0	0
	DES ETHYL SIMAZINE	2	0	0	2	0	0

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DRINKING WATER SURVEILLANCE PROGRAM TILBURY

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SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
PESTICIDES & PCB	PROMETONE	3	0	0	3	0	0
	PROPAZINE	3	0	0	3	0	0
	PROMETRYNE	3	0	0	3	0	0
	METRIBUZIN	3	0	0	3	0	0
	SIMAZINE	3	0	0	3	0	0
	ALACHLOR	3	0	0	3	0	0
	METOLACHLOR	3	0	0	3	0	0
*TOTAL SCAN PESTICIDES & PCB		100	0	2	79	0	2
PHENOLICS	PHENOLICS	3	2	1	3	0	3
*TOTAL SCAN PHENOLICS		3	2	1	3	0	3
SPECIFIC PESTICIDES	TOXAPHENE	0	0	0	0	0	0
	2,4,5-T	2	0	0	2	0	0
	2,4-D	2	0	0	2	0	0
	2,4-DB	2	0	0	2	0	0
	2,4 D PROPIONIC ACID	2	0	0	2	0	0
	DICAMBA	2	0	0	2	0	0
	PICHLORAM	0	0	0	0	0	0
	SILVEX	2	0	0	2	0	0
	DIAZINON	2	0	0	2	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM TILBURY

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SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
SPECIFIC PESTICIDES	DICHLOROVOS	2	0	0	2	0	0
	CHLORPYRIFOS	2	0	0	2	0	0
	ETHION	2	0	0	2	0	0
	AZINPHOS-METHYL	0	0	0	0	0	0
	MALATHION	2	0	0	2	0	0
	MEVINPHOS	2	0	0	2	0	0
	METHYL PARATHION	2	0	0	2	0	0
	METHYLTRITHION	2	0	0	2	0	0
	PARATHION	2	0	0	2	0	0
	PHORATE	2	0	0	2	0	0
	RELDAN	2	0	0	2	0	0
	RONNEL	2	0	0	2	0	0
	AMINOCARB	0	0	0	0	0	0
	BENONYL	1	0	0	2	0	0
	BUX	1	0	0	2	0	0
	CARBOFURAN	1	0	0	2	0	0
	CICP	1	0	0	2	0	0
	DIALLATE	1	0	0	2	0	0
	EPTAM	1	0	0	2	0	0
	IPC	1	0	0	2	0	0
	PROPOXUR	1	0	0	2	0	0
	CARBARYL	1	0	0	2	0	0
	BUTYLATE	1	0	0	2	0	0
*TOTAL SCAN SPECIFIC PESTICIDES		46	0	0	56	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM TILBURY

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
VOLATILES	BENZENE	3	0	1	2	0	1
	TOLUENE	3	0	0	2	0	1
	ETHYLBENZENE	3	0	0	2	0	1
	P-XYLENE	3	0	0	2	0	0
	M-XYLENE	3	0	0	2	0	1
	O-XYLENE	3	0	0	2	0	0
	STYRENE	1	0	1	1	0	0
	1,1 DICHLOROETHYLENE	3	0	0	2	0	0
	METHYLENE CHLORIDE	3	0	0	2	0	0
	T1,2DICHLOROETHYLENE	3	0	0	2	0	0
	1,1 DICHLOROETHANE	3	0	0	2	0	0
	CHLOROFORM	3	0	0	2	2	0
	111, TRICHLOROETHANE	3	0	0	2	0	0
	1,2 DICHLOROETHANE	3	0	0	2	0	0
	CARBON TETRACHLORIDE	3	0	0	2	0	0
	1,2 DICHLOROPROPANE	3	0	0	2	0	0
	TRICHLOROETHYLENE	3	0	0	2	0	0
	DICHLOROBROMOETHANE	3	0	0	2	2	0
	112 TRICHLOROETHANE	3	0	0	2	0	0
	CHLORODIBROMOMETHANE	3	0	0	2	2	0
	T-CHLOROETHYLENE	3	0	0	2	0	0
	BROMOFORM	3	0	0	2	0	2
	1122 T-CHLOROETHANE	3	0	0	2	0	0
	CHLOROBENZENE	3	0	0	2	0	0
	1,4 DICHLOROBENZENE	3	0	0	2	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM TILBURY

SUMMARY TABLE OF RESULTS (1988)

		RAW			TREATED		
SCAN	PARAMETER	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
VOLATILES	1,3 DICHLOROBENZENE	3	0	0	2	0	0
	1,2 DICHLOROBENZENE	3	0	0	2	0	0
	TRIFLUOROCHLOROTOLUE	1	0	0	0	0	0
	ETHLYENE DIBROMIDE	3	0	0	2	0	0
	TOTL TRIHALOMETHANES	3	0	0	2	2	0
*TOTAL SCAN VOLATILES		86	0	2	57	8	6
*TOTAL GROUP ORGANIC		306	2	5	286	8	11
TOTAL		456	108	28	444	97	45

KEY TO TABLE 5 and 6

A ONTARIO DRINKING WATER OBJECTIVES (ODWO)
1. Maximum Acceptable Concentration (MAC)
1+. MAC for Total Trihalomethanes
1*. MAC for Bacteriological Analyses
Poor water quality is indicated when :
- total coliform counts > 0 < 5
- P/A Bottle Test is present after 48 hours
- Aeromonas organisms are detected in more than 25% of samples in a single submission or in successive submissions from the same sampling site
- Pseudomonas Aeruginosa, Staphylococcus Aureus and members of the Fecal Streptococcus group should not be detected in any sample
- Standard Plate Count should not exceed 500 organisms per ml at 35 ^{0}C within 48 hours

2. Interim Maximum Acceptable Concentration (IMAC)
3. Maximum Desirable Concentration (MDC)
4. Aesthetic or Recommended Operational Guideline
- hardness levels between 80 and 100 mg/L as calcium carbonate are considered to provide an acceptable balance between corrosion and incrustation, water supplies with a hardness >200 mg/L are considered poor and those in excess of 500 mg/L are unacceptable.

B HEALTH & WELFARE CANADA (H&W)
1. Maximum Acceptable Concentration (MAC)
2. Proposed MAC
3. Interim MAC
4. Aesthetic Objective (AO) (for xylenes, the AO is a total)

C WORLD HEALTH ORGANIZATION (WHO)
1. Guideline Value (GV)
2. Tentative GV
3. Aesthetic GV

D US ENVIRONMENTAL PROTECTION AGENCY (EPA)
1. Maximum Contaminant Level (MCL)
2. Suggested No-Adverse Effect Level (SNAEL)
3. Lifetime Health Advisory
4. EPA Ambient Water Quality Criteria

F EUROPEAN ECONOMIC COMMUNITY (EEC)
1. Health Related Guideline Level
2. Aesthetic Guideline Level
3. Maximum Admissable Concentration (MADC)

G CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE

H USSR MAXIMUM PERMISSIBLE CONCENTRATION

I NEW YORK STATE AMBIENT WATER GUIDELINE

N/A NONE AVAILABLE

LABORATORY RESULTS, REMARK DESCRIPTIONS

.	No Sample Taken
BDL	Below Minimum Measurable Amount
<T	Greater Than Detection Limit But Not Confident
>	Results Are Greater Than The Upper Limit
<=>	Approximate Result
!AW	No Data: Analysis Withdrawn
!CR	No Data: Could Not Confirm By Reanalysis
!CS	No Data: Contamination Suspected
!IL	No Data: Sample Incorrectly Labelled
!IS	No Data: Insufficient Sample
!LA	No Data: Laboratory Accident
!LD	No Data: Test Queued After Sample Discarded
!NA	No Data: No Authorization To Perform Reanalysis
!NP	No Data: No Procedure
!NR	No Data: Sample Not Received
!OP	No Data: Obscured Plate
!PE	No Data: Procedural Error - Sample Discarded
!PH	No Data: Sample pH Outside Valid Range
!RO	No Data: See Attached Report (no numeric results)
!SM	No Data: Sample Missing
!SS	No Data: Send Separate Sample Properly Preserved
!UI	No Data: Indeterminant Interference
!TX	No Data: Time Expired
A3C	Approximate, Total Count Exceeded 300 Colonies
APL	Additional Peak, Large, Not Priority Pollutant
APS	Additional Peak, Less Than, Not Priority Pollutant
CIC	Possible Contamination, Improper Cap
CRO	Calculated Result Only
PPS	Test Performed On Preserved Sample

RMP	P and M-Xylene Not Separated
RRV	Rerun Verification
RVU	Reported Value Unusual
SPS	Several Peaks, Small, Not Priority Pollutant
UAL	Unreliable: Sample Age Exceeds Normal Limit
UCR	Unreliable: Could Not Confirm By Reanalysis
UCS	Unreliable: Contamination Suspected
UIN	Unreliable: Indeterminant Interference
XP	Positive After X Number of Hours

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STONEY POINT (TILBURY NORTH WSS) 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	
BACTERIOLOGICAL			
FECAL COLIFORM MF (CT/100ML)		DET'N LIMIT = 0	GUIDELINE = 0 (A1)
JUN	0	.	
JUL	BDL	.	
NOV	0 T48	.	
STANDRD PLATE CNT MF (CT/ML)		DET'N LIMIT = 0	GUIDELINE = 500/ML (A1)
JUN	TOP	12 A3C	
JUL	14000	0	
NOV	.	1 <=>	
P/A BOTTLE ( )		DET'N LIMIT = 0	GUIDELINE = 0 (A1*)
JUN	.	0	
JUL	.	0	
TOTAL COLIFORM MF (CT/100ML)		DET'N LIMIT = 0	GUIDELINE = 5/100ML(A1)
JUN	TOP	0	
JUL	10 A3C	0	
NOV	48 A3C	0 T48	
T COLIFORM BCKGRD MF (CT/100ML)		DET'N LIMIT = 0	GUIDELINE = N/A
JUN	TOP	0	
JUL	6000	0	
NOV	4800 >	0 T48	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STONEY POINT (TILBURY NORTH WSS) 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	
CHEMISTRY (FLD)			
FLD CHLORINE (COMB) ( )		DET'N LIMIT = N/A	GUIDELINE = N/A
JUN	.	.200	
NOV	.	.400	
FLD CHLORINE FREE ( )		DET'N LIMIT = N/A	GUIDELINE = N/A
JUN	.	1.500	
JUL	.	1.500	
NOV	.	1.000	
FLD CHLORINE (TOTAL) ( )		DET'N LIMIT = N/A	GUIDELINE = N/A
JUN	.	1.700	
JUL	.	1.500	
NOV	.	1.400	
FLD PH (DIMNSLESS)		DET'N LIMIT = N/A	GUIDELINE = 6.5-8.5(A4)
JUN	7.800	7.600	
JUL	7.200	6.900	
NOV	7.200	7.100	
FLD TEMPERATURE (DEG.C)		DET'N LIMIT = N/A	GUIDELINE = 15 (A1)
JUN	21.000	21.000	
JUL	24.000	24.000	
NOV	6.000	6.000	
FLD TURBIDITY (FTU)		DET'N LIMIT = N/A	GUIDELINE = 1.0 (A1)
JUN	12.600	.320	
JUL	12.450	.130	
NOV	46.000	.220	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STONEY POINT (TILBURY NORTH WSS) 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED		
CHEMISTRY (LAB)				
ALKALINITY (MG/L)			DET'N LIMIT = .200	GUIDELINE = 30-500 (A4)
JUN	101.200	84.800		
JUL	89.300	74.200		
NOV	86.100	68.700		
CALCIUM (MG/L)			DET'N LIMIT = .100	GUIDELINE = 100 (F2)
JUN	32.800	33.200		
JUL	32.200	32.600		
NOV	29.400	31.000		
CYANIDE (MG/L)			DET'N LIMIT = 0.001	GUIDELINE = .200 (A1)
JUN	BDL	.004 <T		
JUL	BDL	BDL		
NOV	BDL	BDL		
CHLORIDE (MG/L)			DET'N LIMIT = .200	GUIDELINE = 250 (A3)
JUN	11.800	15.800		
JUL	8.600	10.900		
NOV	8.500	12.400		
COLOUR (HZU)			DET'N LIMIT = .5	GUIDELINE = 5.0 (A3)
JUN	3.000	.500 <T		
JUL	1.500 <T	BDL		
NOV	BDL	BDL		
CONDUCTIVITY (UMHO/CM)			DET'N LIMIT = 1	GUIDELINE = 400 (F2)
JUN	279	288		
JUL	236	248		
NOV	229	256		
FLUORIDE (MG/L)			DET'N LIMIT = .01	GUIDELINE = 2.400 (A1)
JUN	.100	.080		
JUL	.080	.070		
NOV	.080	.060		
HARDNESS (MG/L)			DET'N LIMIT = .500	GUIDELINE = 80-100 (A4)
JUN	118.000	119.000		
JUL	115.000	115.000		
NOV	104.000	110.000		
IONCAL (DIMNSLESS)			DET'N LIMIT = N/A	GUIDELINE = N/A
JUN	.000 NAF	.000 NAF		

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STONEY POINT (TILBURY NORTH WSS) 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	
LANGELIERS INDEX (DIMNSLESS)		DET'N LIMIT = N/A	GUIDELINE = N/A
JUN	.370 NAF	-.085 NAF	
JUL	.185	-.185	
NOV	.222	-.443	
MAGNESIUM (MG/L)		DET'N LIMIT = .050	GUIDELINE = 30 (F2)
JUN	8.800	8.800	
JUL	8.400	8.200	
NOV	7.500	7.900	
SODIUM (MG/L)		DET'N LIMIT = .200	GUIDELINE = 200 (C3)
JUN	7.200	7.200	
JUL	5.200	5.600	
NOV	5.200	5.800	
AMMONIUM TOTAL (MG/L)		DET'N LIMIT = 0.002	GUIDELINE = .05 (F2)
JUN	.014	.004 <T	
JUL	.010	.002 <T	
NOV	BDL	BDL	
NITRITE (MG/L)		DET'N LIMIT = 0.001	GUIDELINE = 1.000 (A1)
JUN	.006	BDL	
JUL	.003 <T	BDL	
NOV	.003 <T	BDL	
TOTAL NITRATES (MG/L)		DET'N LIMIT = .020	GUIDELINE = 10.000 (A1)
JUN	.390	.395	
JUL	.235	.230	
NOV	.330	.705	
NITROGEN TOT KJELD (MG/L)		DET'N LIMIT = .020	GUIDELINE = N/A
JUN	.380	.380	
JUL	.230	.110	
NOV	.240	.080 <T	
PH (DIMNSLESS)		DET'N LIMIT = N/A	GUIDELINE = 6.5-8.5(A4)
JUN	8.280	7.900	
JUL	8.140	7.850	
NOV	8.230	7.650	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STONEY POINT (TILBURY NORTH WSS) 1988

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM
	RAW	TREATED		
PHOSPHORUS FIL REACT (MG/L)			DET'N LIMIT = .0005	GUIDELINE = N/A
JUN	.004	.002 <T		
JUL	001 <T	.001 <T		
NOV	.001 <T	.001 <T		
PHOSPHORUS TOTAL (MG/L)			DET'N LIMIT = .002	GUIDELINE = .40 (F2)
JUN	.006 <T	.006 <T		
JUL	.023	BDL		
NOV	.025	BDL		
SULPHATE ( )			DET'N LIMIT = .200	GUIDELINE = 500. (A3)
JUL	17.850	30.780		
NOV	17.000	36.000		
TURBIDITY (FTU)			DET'N LIMIT = .02	GUIDELINE = 1.00 (A1)
JUN	8.700	.250		
JUL	13.000	.340		
NOV	18.600	.310		

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STONEY POINT (TILBURY NORTH WSS) 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	
METALS			
SILVER (UG/L)			DET'N LIMIT = .020 GUIDELINE = 50. (A1)
JUN	BDL	BDL	
JUL	BDL	.030 <T	
NOV	BDL	.730	
ALUMINUM (UG/L)			DET'N LIMIT = .050 GUIDELINE = 100.(A4)
JUN	220.400	112.520	
JUL	174.000	59.160	
NOV	150.800	23.200	
ARSENIC (UG/L)			DET'N LIMIT = 0.050 GUIDELINE = 50.0 (A1)
JUN	.480 <T	BDL	
JUL	.750 <T	.250 <T	
NOV	.830 <T	.240 <T	
BARIUM (UG/L)			DET'N LIMIT = 0.020 GUIDELINE = 1000. (A1)
JUN	19.000	18.000	
JUL	17.000	16.000	
NOV	17.000	16.000	
BORON (UG/L)			DET'N LIMIT = 0.200 GUIDELINE = 5000. (A1)
JUN	26.000	21.000	
JUL	20.000 <T	19.000 <T	
NOV	82.000	67.000	
BERYLLIUM (UG/L)			DET'N LIMIT = 0.010 GUIDELINE = .20 (H)
JUN	BDL	BDL	
JUL	BDL	BDL	
NOV	.200 <T	.150 <T	
CADMIUM (UG/L)			DET'N LIMIT = 0.050 GUIDELINE = 5.000 (A1)
JUN	BDL	BDL	
JUL	BDL	BDL	
NOV	.060 <T	BDL	
COBALT (UG/L)			DET'N LIMIT = 0.020 GUIDELINE = 1000 (H)
JUN	33.000	.890 <T	
JUL	17.000	7.500	
NOV	.270 <T	.050 <T	
CHROMIUM (UG/L)			DET'N LIMIT = 0.100 GUIDELINE = 50. (A1)
JUN	1.500	.510 <T	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STONEY POINT (TILBURY NORTH WSS) 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	
COPPER (UG/L)		DET'N LIMIT = .100	GUIDELINE = 1000 (A3)
JUL	2.900	2.400	
NOV	7.000	5.400	
IRON (UG/L)		DET'N LIMIT = 4.000	GUIDELINE = 300. (A3)
JUN	320.000	9.300 <T	
JUL	280.000	BDL	
NOV	280.000	11.000 <T	
MERCURY (UG/L)		DET'N LIMIT = 0.010	GUIDELINE = 1.000 (A1)
JUN	BDL	BDL	
JUL	.020 <T	.020 <T	
NOV	.080	.060	
MANGANESE (UG/L)		DET'N LIMIT = .050	GUIDELINE = 50.0 (A3)
JUN	35.000	.940	
JUL	24.000	6.200	
NOV	13.000	.980	
MOLYBDENUM (UG/L)		DET'N LIMIT = 0.020	GUIDELINE = 500 (H)
JUN	.440 <T	.700	
JUL	.490 <T	.640	
NOV	.350 <T	.580	
NICKEL (UG/L)		DET'N LIMIT = 0.100	GUIDELINE = 50. (F3)
JUN	.510 <T	BDL	
JUL	.350 <T	.230 <T	
NOV	.690 <T	.320 <T	
LEAD (UG/L)		DET'N LIMIT = 0.050	GUIDELINE = 50. (A1)
JUN	.960	.140 <T	
JUL	.680	.160 <T	
NOV	.920	.070 <T	
ANTIMONY (UG/L)		DET'N LIMIT = .050	GUIDELINE = 146. (D4)
JUN	.180 <T	.130 <T	
NOV	.340	.620	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STONEY POINT (TILBURY NORTH WSS) 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	
SELENIUM (UG/L)			DET'N LIMIT = 0.200 GUIDELINE = 10. (A1)
JUN	.380 <T	1.200 <T	
JUL	BDL	.500 <T	
NOV	.500 <T	1.400 <T	
STRONTIUM (UG/L)			DET'N LIMIT = .050 GUIDELINE = 2000.(H)
JUN	140.000	130.000	
JUL	120.000	110.000	
NOV	110.000	120.000	
TITANIUM (UG/L)			DET'N LIMIT = .050 GUIDELINE = N/A
JUN	8.700	2.800	
JUL	9.000	2.100	
NOV	5.800	4.500	
URANIUM (UG/L)			DET'N LIMIT = .020 GUIDELINE = 20. (A2)
JUN	.390	.060 <T	
JUL	.240	BDL	
NOV	.260	.040 <T	
VANADIUM (UG/L)			DET'N LIMIT = .050 GUIDELINE = 100 (H)
JUN	.770	.490 <T	
JUL	.830	.310 <T	
NOV	.530	.140 <T	
ZINC (UG/L)			DET'N LIMIT = .001 GUIDELINE = 5000. (A3)
JUN	5.100	1.600	
JUL	6.000	2.600	
NOV	5.400	2.600	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STONEY POINT (TILBURY NORTH WSS) 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	
PESTICIDES & PCB			
ALPHA BHC (NG/L)		DET'N LIMIT = 1.000	GUIDELINE = 700 (G)
JUN	1.000 <T	1.000 <T	
JUL	BDL	ILA	
NOV	2.000 <T	2.000 <T	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STONEY POINT (TILBURY NORTH WSS) 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	

PHENOLICS

PHENOLICS (UG/L) DET'N LIMIT = 0.2 GUIDELINE = 2.00 (A3)

JUN	1.200	1.000 <T
JUL	.400 <T	.400 <T
NOV	1.200	.200 <T

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STONEY POINT (TILBURY NORTH WSS) 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED		
VOLATILES				
BENZENE (UG/L)			DET'N LIMIT = .050	GUIDELINE = 5.0 (B1)
JUN	BDL		1BT	
JUL	.050 <T		.050 <T	
NOV	BDL		BDL	
TOLUENE (UG/L)			DET'N LIMIT = .050	GUIDELINE = 24.0 (B4)
JUN	BDL		1BT	
JUL	BDL		.100 <T	
NOV	BDL		BDL	
ETHYLBENZENE (UG/L)			DET'N LIMIT = .050	GUIDELINE = 2.4 (B4)
JUN	BDL		1BT	
JUL	BDL		.200 <T	
NOV	BDL		BDL	
M-XYLENE (UG/L)			DET'N LIMIT = .100	GUIDELINE = 300 (B4)
JUN	BDL		1BT	
JUL	BDL		.900 <T	
NOV	BDL		BDL	
STYRENE (UG/L)			DET'N LIMIT = .050	GUIDELINE = 46.5 (D2)
NOV	.150 <T		BDL	
CHLOROFORM (UG/L)			DET'N LIMIT = .100	GUIDELINE = 350 (A1+)
JUN	BDL		1BT	
JUL	BDL		42.300	
NOV	BDL		26.200	
DICHLOROBROMOMETHANE (UG/L)			DET'N LIMIT = .050	GUIDELINE = 350 (A1+)
JUN	BDL		1BT	
JUL	BDL		12.100	
NOV	BDL		10.000	
CHLORODIBROMOMETHANE (UG/L)			DET'N LIMIT = .100	GUIDELINE = 350 (A1+)
JUN	BDL		1BT	
JUL	BDL		5.000	
NOV	BDL		4.900	
BROMOFORM (UG/L)			DET'N LIMIT = .200	GUIDELINE = 350 (A1+)
JUN	BDL		1BT	
JUL	BDL		.400 <T	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STONEY POINT (TILBURY NORTH WSS) 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	
NOV	BDL	.600 <T	

TOTL TRIHALOMETHANES (UG/L) DET'N LIMIT = .500 GUIDELINE = 350 (A1)

JUN	BDL	1BT
JUL	BDL	59.800
NOV	BDL	41.700

Table 6

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
BACTERIOLOGICAL			
STANDARD PLATE COUNT MEMBRANE FILTRATION	CT/ML	0	500/ML(A1)
P/A BOTTLE		0	0 (A1*)
TOTAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	5/100mL(A1)
TOTAL COLIFORM BACKGROUND MF	CT/100ML	0	N/A
CHLOROAROMATICS			
HEXACHLOROBUTADIENE	NG/L	1.000	450. (D4)
1,2,3-TRICHLOROBENZENE	NG/L	5.000	10000 (I)
1,2,3,4-TETRACHLOROBENZENE	NG/L	1.000	10000 (I)
1,2,3,5-TETRACHLOROBENZENE	NG/L	1.000	10000 (I)
1,2,4-TRICHLOROBENZENE	NG/L	5.000	10000 (I)
1,2,4,5-TETRACHLOROBENZENE	NG/L	1.000	38000 (D4)
1,3,5-TRICHLOROBENZENE	NG/L	5.000	10000 (D4)
HEXACHLOROBENZENE	NG/L	1.0	10. (C1)
HEXACHLOROETHANE	NG/L	1.000	1900. (D4)
OCTACHLOROSTYRENE	NG/L	1.000	N/A
PENTACHLOROBENZENE	NG/L	1.000	74000 (D4)
2,3,6-TRICHLOROTOLUENE	NG/L	5.000	N/A
2,4,5-TRICHLOROTOLUENE	NG/L	5.000	N/A
2,6,A-TRICHLOROTOLUENE	NG/L	5.000	N/A
CHLOROPHENOLS			
2,3,4-TRICHLOROPHENOL	NG/L	50.	N/A
2,3,4,5-TETRACHLOROPHENOL	NG/L	50.	N/A
2,3,5,6-TETRACHLOROPHENOL	NG/L	50.	N/A
2,4,5-TRICHLOROPHENOL	NG/L	50.	2600000 (D4)
2,4,6-TRICHLOROPHENOL	NG/L	50.	5000. (B1)
PENTACHLOROPHENOL	NG/L	50.	60000. (B1)
CHEMISTRY (FLD)			
FIELD COMBINED CHLORINE RESIDUAL	MG/L	N/A	N/A
FIELD FREE CHLORINE RESIDUAL	MG/L	N/A	N/A
FIELD TOTAL CHLORINE RESIDUAL	MG/L	N/A	N/A
FIELD PH	DIMENSLESS	N/A	6.5-8.5(A4)
FIELD TEMPERATURE	°C	N/A	<15 °C(A1)
FIELD TURBIDITY	FTU	N/A	1.0 (A1)
CHEMISTRY (LAB)			
ALKALINITY	MG/L	.200	30-500(A4)
CALCIUM	MG/L	.100	100. (F2)
CYANIDE	MG/L	.001	.20(A1)
CHLORIDE	MG/L	.200	250. (A3)
COLOUR	TCU	.5	5.0 (A3)
CONDUCTIVITY	UMHO/CM	1.	400. (F2)
FLUORIDE	MG/L	.01	2.4 (A1)
HARDNESS	MG/L	.50	80-100(A4)
MAGNESIUM	MG/L	.05	30. (F2)

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
NITRITE	MG/L	.001	1.0 (A1)
TOTAL NITRATES	MG/L	.02	10. (A1)
NITROGEN TOTAL KJELDAHL	MG/L	.02	N/A
PH	DMSNLESS	N/A	6.5-8.5(A4)
PHOSPHORUS FIL REACT	MG/L	.0005	N/A
PHOSPHORUS TOTAL	MG/L	.002	.40(F2)
TOTAL SOLIDS	MG/L	1.	500. (A3)
TURBIDITY	FTU	.02	1.0 (A1)
METALS			
ALUMINUM	UG/L	.050	100. (A4)
ANTIMONY	UG/L	.050	146. (D4)
ARSENIC	UG/L	.050	50. (A1)
BARIUM	UG/L	.020	1000. (A1)
BORON	UG/L	.200	5000. (A1)
BERYLLIUM	UG/L	.010	0.20 (H)
CADMIUM	UG/L	.050	5.0 (A1)
COBALT	UG/L	.020	1000. (H)
CHROMIUM	UG/L	.100	50. (A1)
COPPER	UG/L	.100	1000. (A3)
IRON	UG/L	5.0	300. (A3)
MERCURY	UG/L	.01	1.0 (A1)
MANGANESE	UG/L	.050	50. (A3)
MOLYBDENUM	UG/L	.020	500. (H)
NICKEL	UG/L	.100	50. (F3)
LEAD	UG/L	.020	50. (A1)
SELENIUM	UG/L	.200	10. (A1)
SILVER	UG/L	.020	50. (A1)
STRONTIUM	UG/L	.100	2000. (H)
THALLIUM	UG/L	.010	13. (D4)
TITANIUM	UG/L	.100	N/A
URANIUM	UG/L	.020	20. (A2)
VANADIUM	UG/L	.020	100. (H)
ZINC	UG/L	.020	5000. (A3)
PHENOLICS			
PHENOLICS (UNFILTERED REACTIVE)	UG/L	.2	2.0 (A3)
PESTICIDES & PCB			
ALDRIN	NG/L	1.0	700. (A1)
AMETRINE	NG/L	50.	300000. (D3)
ATRAZINE	NG/L	50.	60000. (B3)
ALPHA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	700. (G)
BETA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	300. (G)
GAMMA HEXACHLOROCYCLOHEXANE(LINDANE)	NG/L	1.0	4000. (A1)
ALPHA CHLORDANE	NG/L	2.0	7000. (A1)
GAMMA CHLORDANE	NG/L	2.0	7000. (A1)
BLADEX	NG/L	100.	10000. (B3)
DIELDRIN	NG/L	2.0	700. (A1)
METHOXYCHLOR	NG/L	5.0	100000. (A1)
ENDOSULFAN 1 (THIODAN I)	NG/L	2.0	74000. (D4)
ENDOSULFAN 2 (THIODAN II)	NG/L	4.0	74000. (D4)
ENDRIN	NG/L	4.0	200. (A1)
ENDOSULFAN SULPHATE(THIODAN SULPHATE)	NG/L	4.0	N/A
HEPTACHLOR EPOXIDE	NG/L	1.0	3000. (A1)

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE	
HEPTACHLOR	NG/L	1.0	3000.	(A1)
METOLACHLOR	NG/L	500.	50000.	(B3)
MIREX	NG/L	5.0	N/A	
OXYCHLORDANE	NG/L	2.0	N/A	
O,P-DDT	NG/L	5.0	30000.	(A1)
PCB	NG/L	20.0	3000.	(A2)
O,P-DDD	NG/L	5.0	N/A	
PPDDE	NG/L	1.0	30000.	(A1)
PPDDT	NG/L	5.0	30000.	(A1)
ATRATONE	NG/L	50.	N/A	
ALACHLOR	NG/L	500.	35000.	(D2)
PROMETONE	NG/L	50.	52500.	(D3)
PROPAZINE	NG/L	50.	16000.	(D2)
PROMETRYNE	NG/L	50.	1000.	(B3)
SENCOR (METRIBUZIN)	NG/L	100.	80000.	(B2)
SIMAZINE	NG/L	50.	10000.	(B3)
POLYAROMATIC HYDROCARBONS				
PHENANTHRENE	NG/L	10.0	N/A	
ANTHRACENE	NG/L	1.0	N/A	
FLUORANTHENE	NG/L	20.0	42000.	(D4)
PYRENE	NG/L	20.0	N/A	
BENZO(A)ANTHRACENE	NG/L	20.0	N/A	
CHRYSENE	NG/L	50.0	N/A	
DIMETHYL BENZO(A)ANTHRACENE	NG/L	5.0	N/A	
BENZO(E)PYRENE	NG/L	50.0	N/A	
BENZO(B)FLUORANTHENE	NG/L	10.0	N/A	
PERYLENE	NG/L	10.0	N/A	
BENZO(K)FLUORANTHENE	NG/L	1.0	N/A	
BENZO(A)PYRENE	NG/L	5.0	10.	(B1)
BENZO(G,H,I)PERYLENE	NG/L	20.0	N/A	
DIBENZO(A,H)ANTHRACENE	NG/L	10.0	N/A	
INDENO(1,2,3-C,D)PYRENE	NG/L	20.0	N/A	
BENZO(B)CHRYSENE	NG/L	2.0	N/A	
CORONENE	NG/L	10.0	N/A	
SPECIFIC PESTICIDES				
TOXAPHENE	NG/L	N/A	5000.	(A1)
2,4,5-TRICHLOROBUTYRIC ACID (2,4,5-T)	NG/L	50.	280000.	(B1)
2,4-DICHLOROBUTYRIC ACID (2,4-D)	NG/L	100.	100000.	(A1)
2,4-DICHLORORPHENOXYBUTYRIC ACID	NG/L	200.	18000.	(B3)
2,4-D PROPIONIC ACID	NG/L	100.	N/A	
DICAMBA	NG/L	100.	87000.	(B3)
PICHLORAM	NG/L	100.	2450000.	(D3)
SILVEX (2,4,5-TP)	NG/L	50.	10000.	(A1)
DIAZINON	NG/L	20.	14000.	(A1)
DICHLOROVOS	NG/L	20.	N/A	
DURSBAN	NG/L	20.	N/A	
ETHION	NG/L	20.	35000.	(G)
GUTHION	NG/L	N/A	N/A	
MALATHION	NG/L	20.	160000.	(G)
MEVINPHOS	NG/L	20.	N/A	
METHYL PARATHION	NG/L	50.	7000.	(B3)
METHYLTRITHION	NG/L	20.	N/A	
PARATHION	NG/L	20.	35000.	(B1)

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
PHORATE (THIMET)	NG/L	20.	35. (D2)
RELDAN	NG/L	20.	N/A
RONNEL	NG/L	20.	N/A
AMINOCARB	NG/L	N/A	N/A
BENONYL	NG/L	N/A	N/A
BUX (METALKAMATE)	NG/L	2000.	N/A
CARBOFURAN	NG/L	2000.	18000. (D3)
CICP (CHLORPROPHAM)	NG/L	2000.	350000. (G)
DIALLATE	NG/L	2000.	30000. (H)
EPTAM	NG/L	2000.	N/A
IPC	NG/L	2000.	N/A
PROPOXUR (BAYGON)	NG/L	2000.	90000. (G)
SEVIN (CARBARYL)	NG/L	200.	70000. (A1)
SUTAN (BUTYLATE)	NG/L	2000.	245000. (D3)
VOLATILES			
BENZENE	UG/L	.050	5.0 (B1)
TOLUENE	UG/L	.050	24.0 (B4)
ETHYLBENZENE	UG/L	.050	2.4 (B4)
PARA-XYLENE	UG/L	.100	300. (B4)
META-XYLENE	UG/L	.100	300. (B4)
ORTHO-XYLENE	UG/L	.050	300. (B4)
1,1-DICHLOROETHYLENE	UG/L	.100	7.0 (D1)
ETHLYENE DIBROMIDE	UG/L	.05	50. (G)
METHYLENE CHLORIDE	UG/L	.500	1750. (D3)
TRANS-1,2-DICHLOROETHYLENE	UG/L	.100	350. (D3)
1,1-DICHLOROETHANE	UG/L	.100	N/A
CHLOROFORM	UG/L	.100	350. (A1+)
1,1,1-TRICHLOROETHANE	UG/L	.020	200. (D1)
1,2-DICHLOROETHANE	UG/L	.050	5.0 (D1)
CARBON TETRACHLORIDE	UG/L	.200	5.0 (D1)
1,2-DICHLOROPROPANE	UG/L	.050	10.0 (G)
TRICHLOROETHYLENE	UG/L	.100	5.0 (D1)
DICHLOROBROMOMETHANE	UG/L	.050	350. (A1+)
1,1,2-TRICHLOROETHANE	UG/L	.050	.60(D4)
CHLORODIBROMOMETHANE	UG/L	.100	350. (A1+)
TETRACHLOROETHYLENE	UG/L	.050	10.0 (C2)
BROMOFORM	UG/L	.200	350. (A1+)
1,1,2,2-TETRACHLOROETHANE	UG/L	.050	0.17(D4)
CHLOROBENZENE	UG/L	.100	1510. (D3)
1,4-DICHLOROBENZENE	UG/L	.100	5.0 (B1)
1,3-DICHLOROBENZENE	UG/L	.100	130. (G)
1,2-DICHLOROBENZENE	UG/L	.050	200. (B1)
TRIFLUOROCHLOROTOLUENE	UG/L	.100	N/A
TOTAL TRIHALOMETHANES	UG/L	.500	350. (A1)
STYRENE	UG/L	.05	46.5 (D2)